

# SIEMENS

## POLYMOBIL 10

**SP**

### Start-up Instructions

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## Specially marked text



"Warnings" are information provided with special emphasis when there is the potential for personal injury to the operator or patient.

### CAUTION

"Cautions" are information provided with special emphasis when there is the potential for damage to the equipment.

### NOTICE

"Notices" are information provided with special emphasis to facilitate proper use of the equipment or proper execution of a procedure.


## Tools and measurement devices required

All tools and measurement devices with the exception of the standard service kit are specified in the ARTD / Part 3.

- Standard service kit
- Protective conductor test meter
- Equivalent leakage current meter
- Digital multimeter.

## Safety information and protective measures

**CAUTION**

- When performing service work and tests, adhere to:
  - the product-specific safety information in the document,
  - the safety information in RA0-000.012.... in the Register of the POLYMOBIL 10 binder,
  - as well as the general safety information contained in part 2 of the ARTD.
- Tests and adjustments that must be performed with radiation ON, are identified by the radiation warning symbol  . Radiation protection must be worn during these types of adjustments.

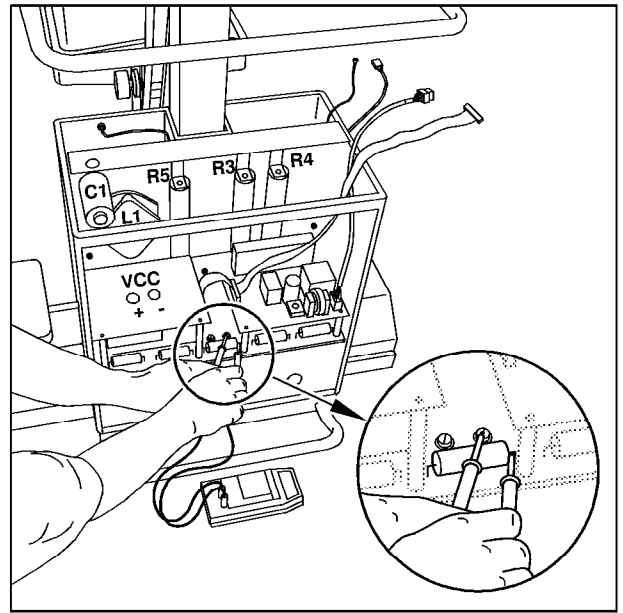


Fig. 1

**⚠ WARNING**

**When working with the system open, there is danger of  
! Electric shock !**

- The capacitor bank can still be charged.  
Do not attempt to work on the system while this condition exists.
- After switching off the system, approximately 350 VDC may still be present in the system; even after disconnecting the line voltage plug. Within 10 minutes this voltage will drop to approximately 10 V.
- Always measure the actual voltage present with the DVM at test points -VCC and +VCC on the D960 inverter board or (more accessible) on the D970 capacitor board at the + connection point of capacitor C3 and on the right side of fuse F3 (refer to Fig. 1).
- LED's V1 ... V10 on D 970 go out at a significantly higher voltage level and therefore they are not reliable safety indicators.
- If a fuse on the D 970 has responded, high voltage may still be present at the affected capacitor even after a prolonged period of time.
- The capacitor discharging circuit utilizes the D 925 board and relays CS and LS. If jumpers X3 or X9 on D 925 or D 950 are not inserted or there is a defect in the circuit, the C-bank will not discharge.  
This can cause life-threatening voltage to be present in the system even after a prolonged period of time.
- Refer also to the POLYMOBIL 10 Service instructions RXR8-120.061.01... "Replacing the capacitor bank".

- Connect the POLYMOBIL 10 only to a line voltage supply (receptacle) that complies with the requirements of VDE 0107 or corresponds to the local national standards.
- Disconnect the POLYMOBIL 10 at the line voltage **OFF** switch on the operating console and disconnect the **line voltage plug** prior to any service work.
- Remove or insert boards with the generator switched OFF only; observe ESD guidelines when handling boards.

### Important start-up information

- After completion of the start-up procedure, the POLYMOBIL 10 which has been completely tested and adjusted at the factory, is ready to operate.
- The POLYMOBIL 10 can be connected to nominal line voltages from 100 V AC through 240 V AC ( $\pm 10\%$ ) and automatically self-adjusts to the existing power line voltage.

#### CAUTION

- **Adhere to the fuse ratings for the on-site receptacle:**
  - 10A slow-blow (on-site) at 180 - 240V  $\pm 10\%$  line voltage
  - 16A slow-blow (on-site) at 100 - 143V  $\pm 10\%$  line voltage
- **The line voltage cable of the POLYMOBIL 10 is supplied with a (Schuko) safety plug.**  
**Install line voltage plugs that comply with the local standards, if required.**

- After start-up, country-specific tests are to be performed, if required; e.g. acceptance test according to RöV (Germany - X-ray ordinance).

Acceptance test according to RöV (Germany):

Required measurements can be partially transferred from the test protocol provided.

The following values are measured at the factory and recorded in the test certificate:

- Light localizer brightness
  - Filter values - visual check
  - Coincidence of light field and radiation field
  - X-ray tube voltage accuracy
  - mAs value check
  - Reproducibility of the radiation
- The test/measurement values identified by the "  $\gg$  " symbol should be entered in the start-up protocol located at the end of these instructions.



## Replacing damaged or missing screws

- As specified in the installation drawings, damaged or missing screws may only be replaced by steel screws conforming to DIN 267 and having the specified tensile strength.

<b>CAUTION</b>
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**All Allen screws must have a tensile strength rating of 8.8.**

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## Cleaning

- The unit must always be switched off or disconnected before cleaning. Use only water to clean the unit or a lukewarm solution consisting of water and a household cleaning agent.
- Do not use abrasive cleaning agents or organic solvents such as benzine, alcohol or spot remover.
- Do not spray water on the unit.
- For additional information, refer to the Operating Instructions "Cleaning/Disinfecting".

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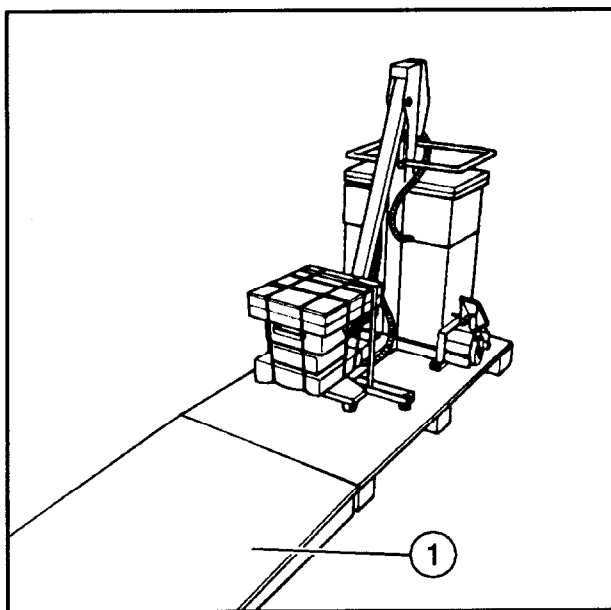


Fig. 1

- Bend the transport brackets on the crate cover upwards and remove the crate cover.
- Bend the transport brackets on the side panels up and remove the side panels.
- Place the side panel with the integrated ramp (1/ Fig. 1) down directly in front of the pallet and engage the retaining tabs.
- Remove the plastic cover.

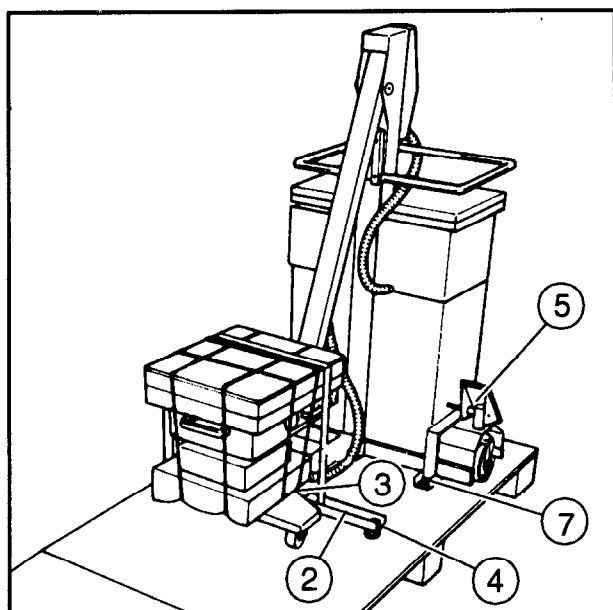


Fig. 2

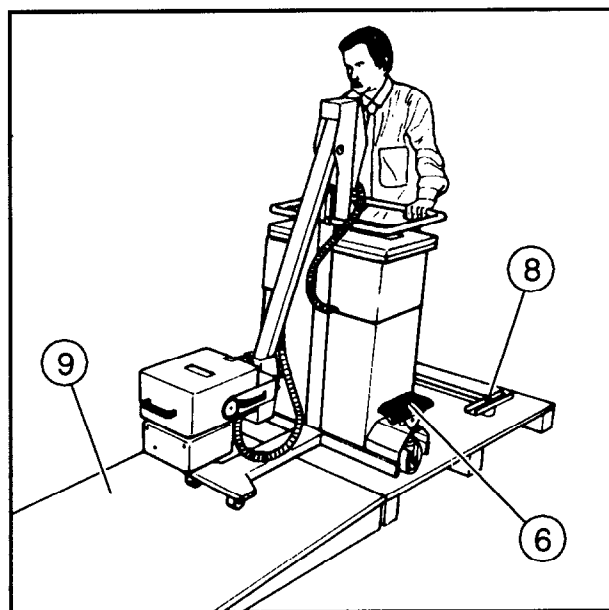


Fig. 3

- Remove the protection covers from the single tank and the collimator.
- Remove the 4 Allen screws (2/Fig. 2, 17 mm spanner opening ), the strap (3/Fig. 2) and the U-shaped rail (4/Fig. 2).
- Bring the foot pedal from the locking position into the maneuvering position (6/Fig. 3). For other foot pedal positions, refer to the operating instructions.
- Remove the 2 Allen screws and the bracket (7/Fig. 2, 17 mm spanner opening) from the stand trolley on the right and left side.
- Push the POLYMOBIL 10 over the rail (8/Fig.3) and move it off the pallet via the ramp (9/ Fig. 3).

## Checking the nominal line voltage

- Using the DVM, measure the local power line voltage at the receptacle.



### NOTICE

The system automatically self-adjusts to the existing power line voltage.

## Attaching the warning label

- Attach the warning label printed in the appropriate language, item number 18 13 554, to the operating console (1/Fig.1).

### NOTICE

The warning label is located in the POLYMOBIL 10 binder.

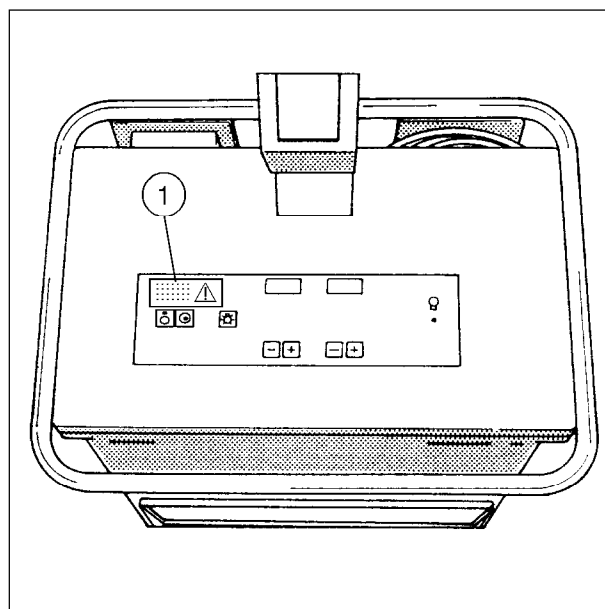



Fig. 1

## Checking the controls and indicators

### NOTICE

If errors occur during the following checks, please refer to the service instructions.

- Connect the line voltage plug to the safety receptacle.
  - Press the ON key  (5/Fig. 5) on the control console.
- ➡ After switching the system on, it executes an initialization routine as follows:

Initialization

---  
kV

---  
mAs

The POLYMOBIL 10 is ready for exposure: the kV display no longer flashes (between - - - and kV value)

Default values acc.  
to setting

60  
kV

10  
mAs

### NOTICE

If the system has not been used for a period of time, the capacitor leakage current increases. When the system is first switched on, ERR1 may appear, which indicates a high leakage current. This error will normally disappear, if the system is switched off and on again.  
If the error remains, perform the service program "Configuring the capacitor bank" (Pr.1) according to the service instructions.



- Select all the mAs values by pressing the  $\pm$  mAs keys from 0.32 . . . 100 mAs.
- Select all the kV values by pressing the  $\pm$  kV keys from 40 . . . 125 kV.

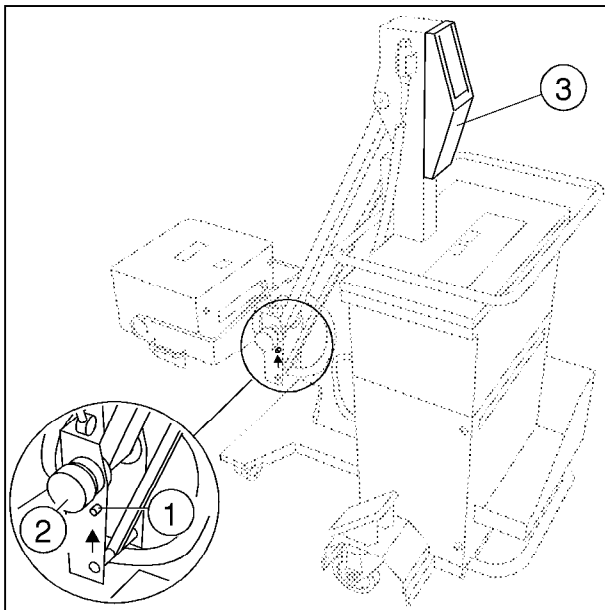


Fig. 2

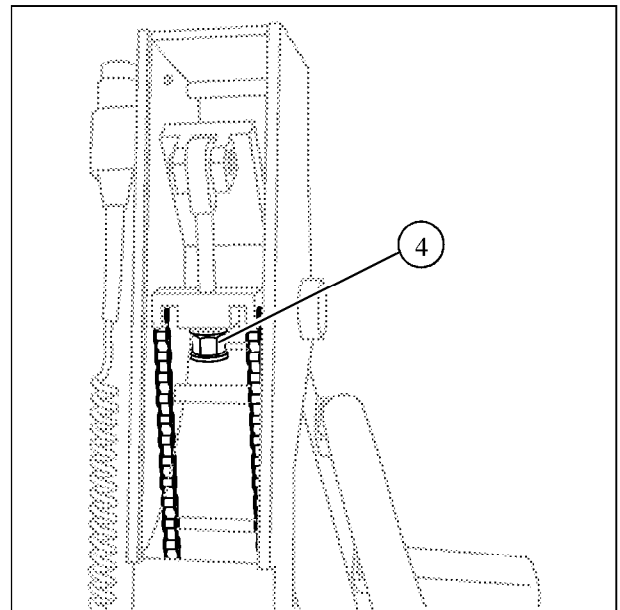


Fig. 3

## Checking the counterbalance system

- Unlock the support arm (1/Fig. 2) and loosen the knob (2/Fig. 2). The support arm **without** attached accessories should move through the entire range easily and should stop in any position. ➤

## Readjusting the counterbalance system with accessories attached

- If the support arm with accessories attached does not stop in any desired position, readjust the spring tension for the counterbalance.
- Remove the cover (3/Fig. 2) from the stand.
- Release the supplemental brake on the support arm (2/Fig. 2).
- Move the support arm into the horizontal position.
- Tighten the screw (4/Fig. 3) using a 17-mm open-ended wrench. Adjust the spring tension in such a way, that there is a balance when the support arm is in the horizontal position, i.e. that equal force is required to lift and lower the tube assembly.

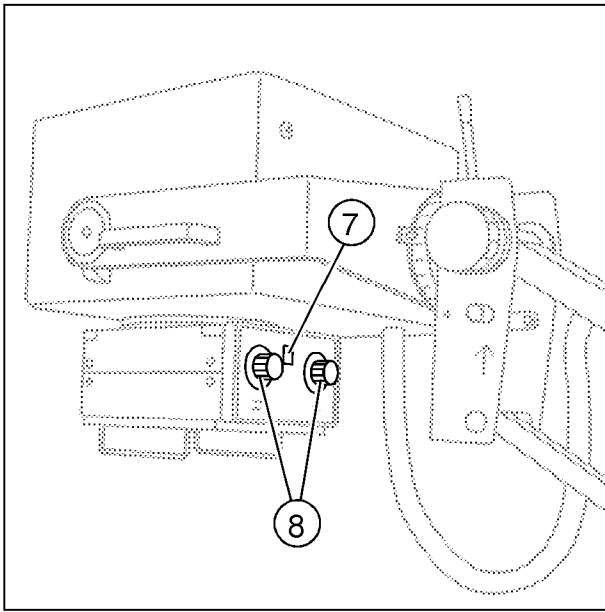


Fig. 4

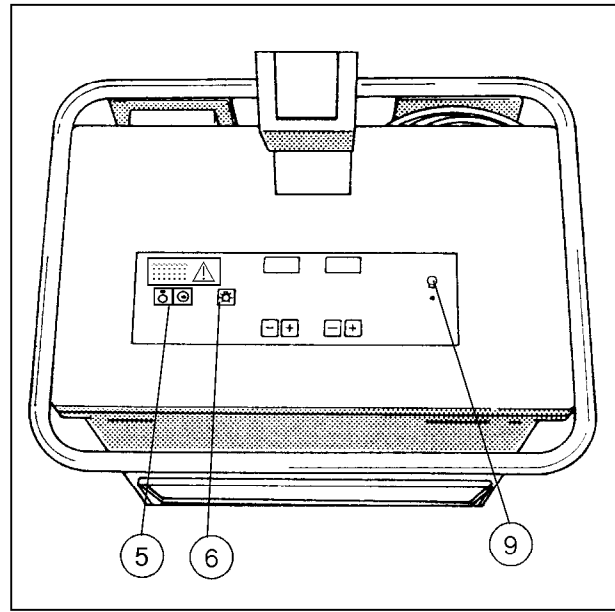



Fig. 5

### Checking the controls on the double-slot diaphragm

- Check the light localizer at the control console and at the double-slot diaphragm in each case.  
Press the  key (6/Fig. 5 or 7/Fig. 4); the light localizer lamp lights up for  $20s \pm 1s$ .
- Check whether the double-slot diaphragm rotates through  $\pm 45^\circ$ .
- Check the ease and uniformity of the format adjustment (blade pair) by rotating the collimator adjustment knob (8/Fig. 4).

### Checking the exposure release with high voltage

- Close the double-slot diaphragm.  
Set 60 kV, 10 mAs.
- Release an exposure.  
The radiation indicator (9/Fig. 5) lights during an exposure; at the same time, an acoustic signal sounds.





## Checking the exposure control

- Check the exposure control with the following setting:  
60 kV, 100 mAs
- Using a clock, check the acoustic signal for the exposure time.



Proceed as follows:

- ⇒ Release an exposure; the radiation indicator (9/Fig. 5) lights up.
- ⇒ The exposure must switch off after max. 3s.
- ⇒ The radiation indicator goes out, the acoustic signal stops.

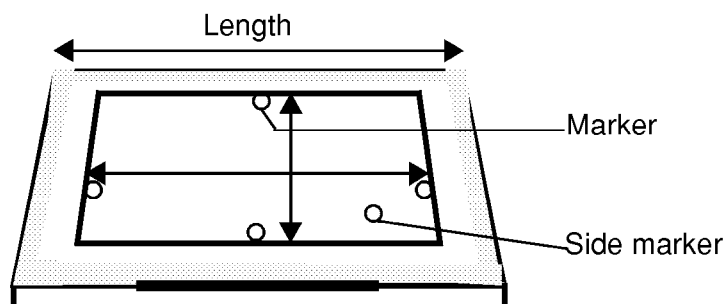


## Custom programming

- The maximum possible kV and mAs values can be programmed with service program Pr.6 (refer to the service instructions "Service programs").
- The default exposure parameters can be programmed with service program Pr.5 (refer to service instructions "Service programs")



## Checking coincidence of light and radiation fields

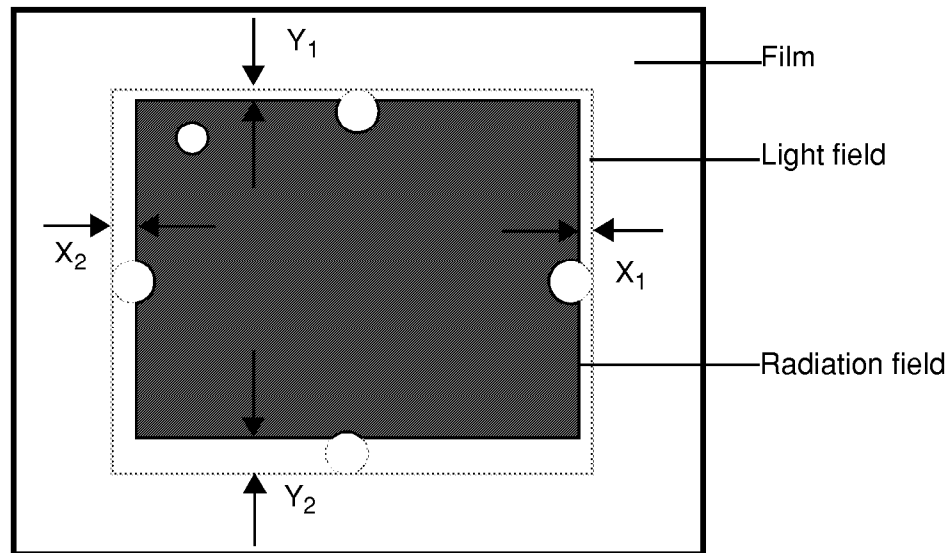


- Load a 24 cm x 30 cm or 10" x 12" cassette with film and place it on a table or a similar surface.
- Set the vertical SID to 100 cm or 40" with the measuring tape reaching to the upper edge of the cassette.
- With the control buttons set a format of 18 cm x 24 cm or 8" x 10".
- Switch on the light localizer and align the cassette.
- Place radiolucent markers (e.g. washers, coins) on the cassette as shown in the sketch. Use one washer as side marking.
- Release an exposure (60 kV, 10mAs) and develop the film.
- On the developed film, write the following data with a waterproof felt pen:
  - SID setting
  - film size
  - radiation field size



**Evaluation:**

- Measure the deviations ( $X_1, X_2, Y_1, Y_2$ ) between the edges of the light field and of the radiation field on all four sides, as in the sketch.
- Calculate the sum of the deviations in the X and Y directions (without regard to sign).



- The longitudinal deviation ( $\Sigma Y$ ) as well as the width deviation ( $\Sigma X$ ) has to be smaller than 1.6 cm.

**NOTICE**

In case of deviations greater than 1.6 cm, see **Service Instructions Chapter "Checking coincidence of light and radiation fields"**.

- Switch **OFF** the POLYMOBIL and disconnect the line voltage cable.

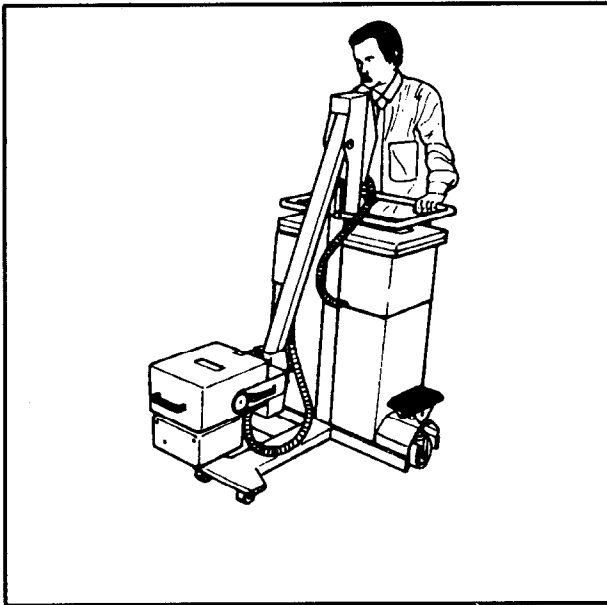


Fig. 1

## Protective conductor measurement

- Perform the protective conductor measurement according to ARTD-002.731.17...  
"Safety technical information for installation and start-up".  
Protective conductor resistance  $\leq 0.2 \text{ ohm}$ .



## Equivalent leakage current measurement

- Perform the equivalent leakage current measurement in accordance with  
ARTD-002.731.17...  
"Safety technical information for installation and start-up".

## Initial measurement

When measuring the equivalent leakage current, an initial measurement as well as repeat measurements are taken. The purpose of these repeat measurements is to detect deviations from the "initial" measurement and thus to recognize changes in the safety structure of the system as early as possible.

The initial value measured may not exceed the maximum value of **2 mA**.

Conform to the measurement setup shown in Fig. 2.

During the measurement, POLYMOBIL 10 must be switched on. Therefore, when using the BENDER Safety tester, it must be set to manual measurement.

The "initial" value should be entered in the test protocol at the end of these start-up instructions.



**Repeat measurements**

After performing any necessary repair work and after maintenance work in general, measure the equivalent leakage current again.

The value measured must not exceed the maximum acceptable limit value of 2 mA. In addition, this value may not exceed the initial value by more than 50%.

The results of the measurement must be documented.

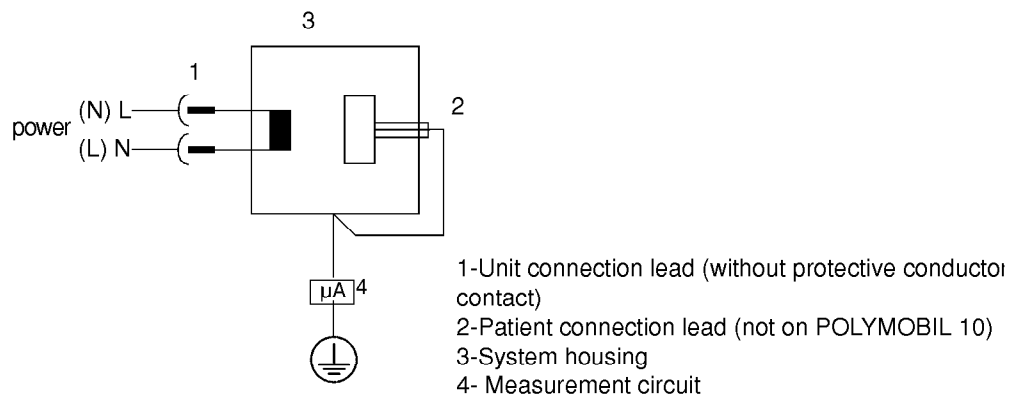


Fig. 2 - Measuring the equivalent leakage current for systems in operation.

- Roll up the power line cable on the cable holder in back of the control console.
- Move the support arm (Fig. 1) into the travel position and check the locking mechanism.

## POLYMOBIL 10 Start-up protocol

The Start-up protocol follows the same format as the start-up instructions.

Item number / Type number / Serial number: .....

Customer: ..... Customer number: .....

1. Nominal line voltage check .....  $V_{AC}$
2. Attaching the warning label ☐ ok
3. Check of controls and indicators ☐ ok
4. Check of the counterbalance system ☐ ok
5. Check of controls on the double slot diaphragm ☐ ok
6. Check of exposure release with high voltage ☐ ok
7. Check of exposure control ☐ ok
8. Custom programming
 

Maximum possible kV: ..... kV  
 Maximum possible mAs: ..... mAs  
 Default exposure parameters: ..... kV  
 ..... mAs
9. Coincidence of light and radiation fields ☐ ok

$\Sigma X$ : ..... cm  
 $\Sigma Y$ : ..... cm
10. Protective conductor measurement ..... mOhm
11. Equivalent leakage current measurement .....mA

Date: .....

Service engineer.....

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Start-up protocol added

Editorial changes

TD PS 24 / Friedrich  
TD SD 34/ Groß  
SMS Iselin / O'Donnell

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